Application Of Particle Swarm Optimization Algorithm To Multiuser Detection In CDMA

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Personal, Indoor and Mobile Radio Communications, 2005. PIMRC 2005. IEEE 16th International Symposium on;Publication Date: 11-14 Sept. 2005;Vol: 4,On page(s): 2522- 2526 Vol. 4; ISBN: 9783800729098

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Summary

Multiple access interference and near-far effect cause performance limitation in the conventional single-user detector used in direct sequence/code division multiple access (DS-CDMA)-systems. In this paper, we present a novel multiuser detector (MUD) based on the new heuristic algorithm known as particle swarm algorithm (MUDPSO). We evaluate the BER performance of the proposed algorithm, by means of Monte Carlo simulation technique, and compare it to the BER performances of both the matched filter detector and the decorrelator multiuser detectors. We show that the new algorithm outperforms the other two. Moreover, the performance under near-far scenario, the system capacity and the computational complexity of the proposed detector are also investigated.